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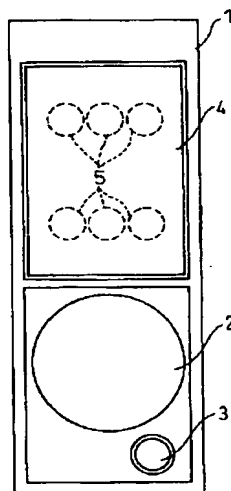
(54) 【考案の名称】 スピーカ

(57) 【要約】

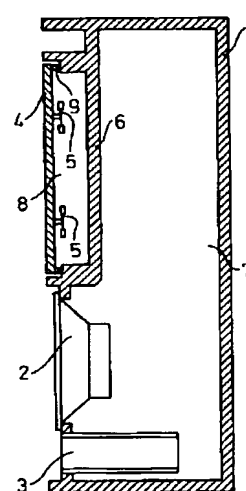
【課題】 低音から高音まで十分に高い音圧レベルを確保する。

【解決手段】 スピーカボックス1の前面にダイナミックスピーカ2と音響振動板4とを配置し、音響振動板4を複数の圧電振動板5によって駆動する。ダイナミックスピーカ2が低音を担当し、音響振動板4が高音を担当する。

(A)



(B)



1…スピーカボックス 4…音響振動板  
2…ダイナミックスピーカ 5…圧電振動板

1

2

## 【実用新案登録請求の範囲】

【請求項1】 スピーカボックスに低音用のダイナミックスピーカと高音発生用の音響振動板を配置し、該音響振動板を複数の圧電振動板によって振動せしめるようにしたスピーカ。

【請求項2】 該音響振動板が薄肉平板状をなすと共に該音響振動板を弾性部材を介してスピーカボックスにより支持し、該音響振動板の背面上に互いに間隔を隔てて各圧電振動板を配置した請求項1に記載のスピーカ。

【請求項3】 各圧電振動板に夫々振動減衰用ゴム板を取付けた請求項1に記載のスピーカ。

\*

## \*【図面の簡単な説明】

【図1】スピーカの全体図であって、(A)は正面図を示し、(B)は側面断面図を示す。

【図2】圧電振動板の全体図であって、(A)は側面断面図を示し、(B)は正面図を示す。

## 【符号の説明】

1…スピーカボックス

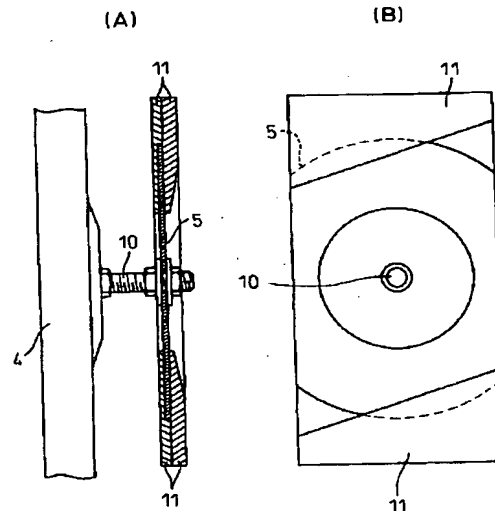
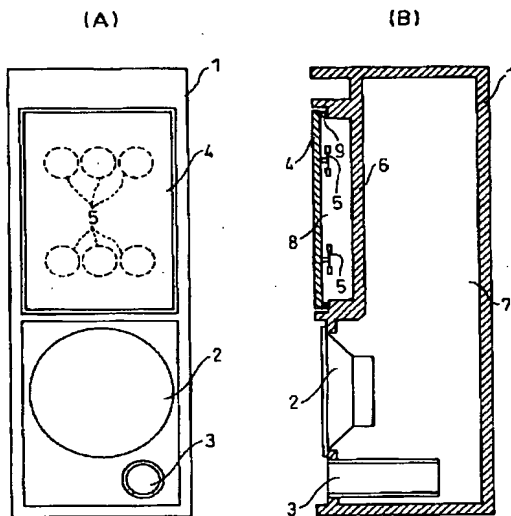
2…ダイナミックスピーカ

4…音響振動板

5…圧電振動板

【図1】

【図2】



1…スピーカボックス  
2…ダイナミックスピーカ  
4…音響振動板  
5…圧電振動板

**【考案の詳細な説明】****【0001】****【考案の属する技術分野】**

本考案はスピーカに関する。

**【0002】****【従来の技術】**

スピーカの音源として圧電振動板、例えばバイモルフを用いることが知られている。

**【0003】****【考案が解決しようとする課題】**

しかしながら圧電振動板の振巾は小さく、従って圧電振動板を用いて低音の音圧を十分に高くすることは困難であるという問題がある。

**【0004】****【課題を解決するための手段】**

上記問題点を解決するために本考案によれば、スピーカボックスに低音用のダイナミックスピーカと高音発生用の音響振動板を配置し、音響振動板を複数の圧電振動板によって振動せしめるようにしている。即ち、低音はダイナミックスピーカが担当し、高音は複数の圧電振動板によって駆動せしめられる音響振動板が担当する。

**【0005】****【考案の実施の形態】**

図1(A), (B)を参照すると、1はスピーカボックス、2は低音用のダイナミックスピーカ、3はダクト、4は高音発生用の薄肉平板状音響振動板、5は音響振動板4の背面において互いに間隔を隔てて配置された複数の圧電振動板を夫々示す。

**【0006】**

スピーカボックス1内は隔壁6によって大きな容積の部屋7と小さな容積の部屋8とに完全に分離されている。大きな部屋7はダクト3を介して外気に連通しており、従ってダイナミックスピーカ2についてみるとバスフレックス型の構造

を有している。一方、音響振動板4の周辺部は弾性部材9を介してスピーカボックス1により支持されており、従って小さな部屋8は実質的に密閉空間となっている。

#### 【0007】

図1(A), (B)に示す実施例では音響振動板4の背面上に6個の圧電振動板5が取付けられており、これら圧電振動板5の一例を図2(A), (B)に示す。圧電振動板5はその両側面上に圧電素子層が形成されており、この圧電振動板5に音声信号を印加すると音声信号の電圧レベルに応じて前後方向に湾曲を繰り返す。図2(A), (B)に示される実施例では圧電振動板5は湾曲しやすいように円板の互いに対向する側部を切除したような形状を有している。

#### 【0008】

一方、図2(A), (B)に示される実施例では圧電振動板5の中心部はロッド10を介して音響振動板4に連結されており、また圧電振動板5の互いに対向する両端部には振動減衰用ゴム板11が固着されている。なお、図2(A)に示すように各ゴム板11は一对のゴム板の積層構造からなる。各圧電振動板5に音声信号が印加されると各圧電振動板5は同一の位相でもって前後方向に湾曲を繰り返す。

#### 【0009】

圧電振動板5が湾曲したときにゴム板11は慣性質量体としての役目を果し、従ってこのときゴム板11は慣性力によって元の位置に停止し続けようとするので圧電振動板5の中心部が前後方向に移動し、斯くしてロッド10を介して音響振動板4が振動せしめられることになる。また、ゴム板11は圧電振動板5の振動を吸収し、圧電振動板5の共振作用を抑制してフラットな音圧レベルを確保する機能を果す。

#### 【0010】

圧電振動板5は高周波の音声信号に対して応答性がよく、従って複数の圧電振動板5を用いて音響振動板4を振動させると音色のよい十分音圧の高い高音が得られる。一方、ダイナミックスピーカ2によって音色のよい十分に音圧の高い低音が得られる。

【0011】

【考案の効果】

低音から高音に亘って十分な音圧が得られる。

AD

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CLAIMS

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[Utility model registration claim]

[Claim 1] The loudspeaker arrange [ loudspeaker ] the acoustic oscillation plate the dynamic loudspeaker for bass, and for loud-sound generating in a loudspeaker box, and it was made to make this acoustic oscillation plate vibrate with two or more piezo-electric diaphragms.

[Claim 2] The loudspeaker according to claim 1 which supported this acoustic oscillation plate with the loudspeaker box through the elastic member while this acoustic oscillation plate made light-gage plate-like one, separated spacing mutually on the tooth back of this acoustic oscillation plate, and has arranged each piezo-electric diaphragm.

[Claim 3] It is a loudspeaker given [ the rubber plate for periodic damping ] in mounting beam claim 1 to each piezo-electric diaphragm, respectively.

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DETAILED DESCRIPTION

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[Detailed explanation of a design]

[0001]

[The technical field to which a design belongs]

This design is related with a loudspeaker.

[0002]

[Description of the Prior Art]

Using a piezo-electric diaphragm, for example, bimorph, as a sound source of a loudspeaker is known.

[0003]

[Problem(s) to be Solved by the Device]

However, the amplitude of a piezo-electric diaphragm is small, therefore making sound pressure of bass high enough using a piezo-electric diaphragm has the problem of being difficult.

[0004]

[Means for Solving the Problem]

In order to solve the above-mentioned trouble, he arranges the acoustic oscillation plate the dynamic loudspeaker for bass, and for loud-sound generating in a loudspeaker box, and is trying to make an acoustic oscillation plate vibrate with two or more piezo-electric diaphragms according to this design. That is, a dynamic loudspeaker takes charge of bass and the acoustic oscillation plate you are made to drive with two or more piezo-electric diaphragms takes charge of loud sound.

[0005]

[The gestalt of implementation of a design]

When drawing 1 (A) and (B) are referred to, 1 shows a loudspeaker box, the dynamic loudspeaker for bass in 2, the light-gage plate-like acoustic oscillation plate for [ 3 ] loud-sound generating in a duct and 4, and two or more piezo-electric diaphragms arranged by 5 separating spacing mutually in the tooth back of the acoustic oscillation plate 4, respectively.

[0006]

The inside of the loudspeaker box 1 is thoroughly separated into the chamber 7 of the big volume, and the chamber 8 of the small volume by the septum 6. If the big chamber 7 is open for free passage in the open air through a duct 3, therefore is seen about a dynamic loudspeaker 2, it has the structure of a bus flex time mold. On the other hand, the periphery of the acoustic oscillation plate 4 is supported by the loudspeaker box 1 through the elastic member 9, therefore the small chamber 8 serves as a closed space substantially.

[0007]

In the example shown in drawing 1 (A) and (B), six piezo-electric diaphragms 5 are attached on the tooth back of the acoustic oscillation plate 4, and an example of these piezo-electricity diaphragm 5 is shown in drawing 2 (A) and (B). The piezoelectric-device layer is formed on that both-sides side, and the piezo-electric diaphragm 5 will repeat a bow to a cross direction according to the voltage level of a sound signal, if a sound signal is impressed to this piezo-electric diaphragm 5. In the example shown in drawing 2 (A) and (B), the piezo-electric diaphragm 5 has a configuration which excised the flank which counters mutually [ a disk ] so that it may be

easy to curve.

[0008]

On the other hand, in the example shown in drawing 2 (A) and (B), the rubber plate 11 for periodic damping has fixed in the both ends to which the core of the piezo-electric diaphragm 5 is connected with the acoustic oscillation plate 4 through the rod 10, and the piezo-electric diaphragm 5 counters mutually. In addition, as shown in drawing 2 (A), each rubber plate 11 consists of a laminated structure of the rubber plate of a couple. If a sound signal is impressed to each piezo-electric diaphragm 5, each piezo-electric diaphragm 5 will repeat a bow to a cross direction as it is also at the same phase.

[0009]

When the piezo-electric diaphragm 5 curves, the rubber plate 11 achieves the duty as an inertial-mass object, therefore at this time, since it tends to continue suspending the rubber plate 11 in the original location with an inertia force, the core of the piezo-electric diaphragm 5 moves it to a cross direction, and the acoustic oscillation plate 4 is made to vibrate through a rod 10 thus. Moreover, the rubber plate 11 absorbs an oscillation of the piezo-electric diaphragm 5, and achieves the function to control a resonance operation of the piezo-electric diaphragm 5, and to secure flat sound pressure level.

[0010]

If the piezo-electric diaphragm 5 often therefore vibrates [ responsibility ] the acoustic oscillation plate 4 using two or more piezo-electric diaphragms 5 to the sound signal of a RF, loud sound with high enough sound pressure with a sufficient tone will be obtained. On the other hand, bass with fully high sound pressure with a sufficient tone is obtained by the dynamic loudspeaker 2.

[0011]

[Effect of the Device]

Loud sound is covered from bass and sufficient sound pressure is obtained.

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[Translation done.]



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TECHNICAL FIELD

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[The technical field to which a design belongs]

This design is related with a loudspeaker.

[0002]

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PRIOR ART

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[Description of the Prior Art]

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EFFECT OF THE INVENTION

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[Effect of the Device]

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TECHNICAL PROBLEM

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MEANS

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[Means for Solving the Problem]

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[0011]

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the general drawing of a loudspeaker, and (A) shows a front view and (B) shows a side-face sectional view.

[Drawing 2] It is the general drawing of a piezo-electric diaphragm, and (A) shows a side-face sectional view and (B) shows a front view.

[Description of Notations]

1 -- Loudspeaker box

2 -- Dynamic loudspeaker

4 -- Acoustic oscillation plate

5 -- Piezo-electric diaphragm

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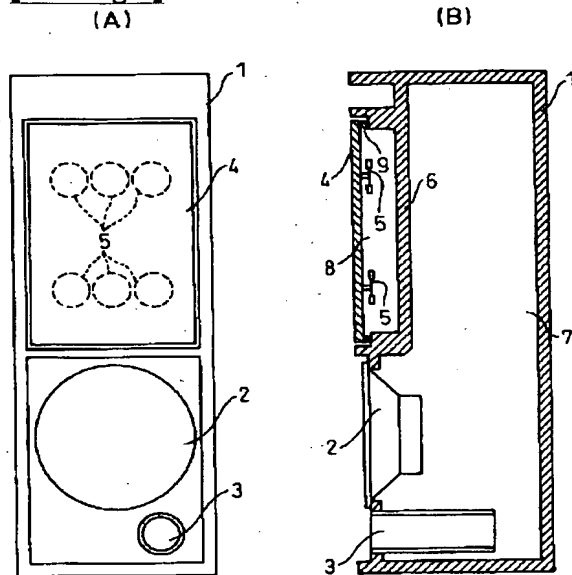
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## DRAWINGS

[Drawing 1]



1...スピーカボックス 4...音響振動板  
2...ダイナミックスピーカ 5...圧電振動板

[Drawing 2]

